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ABSTRACT

An interpretive studies project on applying reinforcement principles in the classroom was conducted by Dr. Edward M. Glaser of the Human Interaction Research Institute, Los Angeles, California and Dr. Irwin G. Sarason of the University of Washington, Seattle. PREP kit No. 18 has been adapted from the teacher's guide to behavioral modification entitled "Reinforcing Productive Classroom Behavior" resulting from that study. This guide, which reflects the contributions of teachers, principles, psychologists and counselors, contains a description of some common elementary classroom problems, suggestions for establishing a classroom climate that leads to increased learning, examples of practical applications of behavioral principles, and illustrative case studies based upon research investigations. A brief glossary is appended, as well as an annotated bibliography and a list of related documents available from EDRS. (Author/LS)

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putting research into educational practice

PROBLEM ► RESEARCH ►

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PREP PREP PREP BRIEF

No. 18

REINFORCING PRODUCTIVE CLASSROOM BEHAVIOR

-- A Teacher's Guide to Behavior Modification --

- John is 2 years below grade level in reading achievement as measured on a standardized reading test.
- Mary has yet to hand in a completed assignment.
- Peter yells out without the teacher's permission an average of 5 times per hour during arithmetic period.
- Carla taps her pencil and rattles objects.
- LeRoy has been in 12 fights during the last 2 months.

How can the teacher deal with these and numerous other disruptive behavior problems in order to create a classroom climate in which each child can achieve a greater measure of academic and social competency and in which he, as teacher, can realize his potential, be more than a babysitter, and become, truly, a teacher?

More and more teachers all over the country are beginning to find an answer to this question. They are discovering an appropriate and useful tool that combines the philosophy of humanism--with its emphasis on individual worth--and the techniques of science, with its emphasis on cause/effect and objective appraisal. Whether one uses the name positive feedback, reinforcement theory of learning, operant conditioning, precision teaching, or behavior modification, behavior techniques seem to offer some of the most innovative and constructive approaches available at the present time for establishing a more productive classroom environment.

Behavior that is rewarded tends to be repeated, while behavior that is not rewarded is not likely to be repeated. By applying behavioral principles stemming from this basic one, which is certainly not new, teachers can and are increasing learning and are making their classrooms more satisfying and productive places.

Some Principles of Behavior Modification

--Behavior is influenced by its consequences.

--A teacher's behavior influences a pupil's behavior.

- By providing certain kinds of consequences, teachers can influence or modify their pupils' behavior. They can increase the occurrence of desired behaviors and decrease the occurrence of those which are not desirable. In judging the effectiveness of either a positive or negative reinforcer, one must be attentive to the observable behavior of the child. One student may beam with pleasure when the teacher says, "I'm proud of you," while another may cringe at the same words. Then, too, what the teacher expects to be a punishment may prove to be a possible reinforcer instead--for instance, the child who becomes a hero to his peers when he is scolded. Keeping individual differences in mind is key.

- The more promptly reinforcement follows an act, the more effective it will be.
- The stimulus materials or reinforcer can be changed--but only one thing at a time should be changed in order to know what is bringing about improvement.
- In some cases, simply ignoring unproductive behavior is effective in extinguishing it.

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The How-To of Behavior Modification

Applying the techniques of behavior modification involves at least five steps.

--Establishing reasonable and ethical goals

Teachers should ask themselves:
- What kind of student behavior interferes with the learning of the rest of the class, and what is perhaps annoying to me but essentially harmless to the learner and his peers?
- Are my classroom regulations really for the benefit of the students...or primarily for my own comfort and convenience?
- Have I discussed my goals *for* the child *with* the child and his parents?

--Making class rules

Some teachers feel that this approach does not fit their style, while others consider it a productive technique. Some helpful guidelines are:
- Keep the rules short and to the point so they can be memorized.
- Start out with only one or two rules and add others gradually.
- Try to phrase the rules positively.

--Observing and recording behavior

By keeping an objective record of a child's behavior from the time the unproductive activity is identified and observed until after the behavior has changed, the teacher is able to gauge his effectiveness. No matter which method is used to record, one instance is not enough. Behavior needs to be recorded regularly, perhaps 15- or 30-minute periods, over a period of several days, perhaps even as long as 2 weeks. There are four distinct periods in making a behavior modification chart:

- Baseline period
- Reinforcement period
- Reversal period
- Return to the reinforcement period

--Increasing productive behavior
- Catch the children being productive
- Point out productive behavior
- Devise individualized effective reinforcers
- Try contingency contracts
- Start small
- Vary comments

--Decreasing unproductive behavior
- Ignoring
- Isolation
- Looking for the positive

A general caution on the "how-to" of behavior modification is: *Don't try to do too much at once.*

For More Information

An interpretive studies project on applying reinforcement principles in the classroom was conducted by Dr. Edward Glaser of the Human Interaction Research Institute, Los Angeles, California, and Dr. Irwin G. Sarason of the University of Washington, Seattle, for the U.S. Office of Education. The results of this study, a teacher's guide to behavior modification entitled "Reinforcing Productive Classroom Behavior" will soon be available from the ERIC Document Reproduction Service (EDRS), The National Cash Register Company, 4936 Fairmont Blvd., Bethesda, Maryland 20014.

A PREP kit--No. 18--has been adapted from the teacher's guide. The kit, "Reinforcing Productive Classroom Behavior--A Teacher's Guide to Behavior Modification," deals with the world of the classroom, the principles and how-to of behavior modification, putting principles into practice, and four classroom case studies. Also included is a glossary and a selected bibliography. Kit No. 18 will also be available from EDRS.

PREP

No. 18

PREP is . . .

- *a synthesis and interpretation of research, development, and current practice on a specific educational topic*
- *a method of getting significant R&D findings to the practitioner quickly*
- *the best thinking of researchers interpreted by specialists in simple language*
- *the focus of research on current educational problems*
- *a format which can be easily and inexpensively reproduced for wide distribution*
- *raw material in the public domain which can be adapted to meet local needs*
- *an attempt to improve our Nation's schools through research*
- P *utting*
  R *esearch into*
  E *ducational*
  P *ractice*

REINFORCING PRODUCTIVE CLASSROOM BEHAVIOR

-- A Teacher's Guide to Behavior Modification

- *John is 2 years below grade level in reading achievement as measured on a standardized reading test.*
- *Peter yells out an average of 5 times per hour during arithmetic period.*
- *LeRoy has been in 12 fights during the last 2 months.*
- *Richard is out of his seat at least 25 times each day.*
- *Carla taps her pencil and rattles objects.*
- *Mary has yet to hand in a completed assignment.*
- *Jed chews and pops his gum in class.*
- *Leona refuses to read aloud during the reading period.*
- *Charles has not completed a single page in his reading workbook within the allotted time.*

All elementary school teachers have problems like these. Taken individually, these behaviors are somewhat disruptive; when they occur simultaneously, however, they can create havoc in the classroom. Such behaviors are frequently self-defeating for the child, frustrating for the teacher, and hinder the attainment of sound educational goals. Can these behaviors be modified? Can a more productive classroom environment be established? Can teachers achieve educational objectives compatible with their own value orientations through the use of behavior modification techniques?

Dr. Edward M. Glaser of the Human Interaction Research Institute, Los Angeles, California, and Dr. Irwin G. Sarason of the University of Washington, Seattle, believe

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that behavior techniques offer some of the most innovative and constructive approaches available at the present time. In this *Guide* they provide teachers and others who work with children some practical suggestions which have been validated in research studies. The *Guide* reflects the contributions of many teachers, principals, psychologists, and counselors; and although the examples are drawn from the elementary school classroom, teachers who work with older children will probably find useful ideas that can be applied at the junior and senior high school levels.

The *Guide* contains a description of some common elementary classroom problems, the principles and ethical considerations in the use of behavior modification, some suggestions for establishing a classroom climate that leads to increased learning, examples of practical applications of behavioral principles, and illustrative case studies based upon research investigations. A brief glossary is appended, as well as an annotated bibliography to provide additional resource material for the reader who wants further information.

This Guide was prepared pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

The World Of The Classroom

"' Reeling and writhing, to begin with,' said the mock turtle."
Alice in Wonderland, Ch. LX

The following hypothetical classroom situations are drawn from the experiences of a number of teachers, counselors, and psychologists who have tried behavior modification[1] approaches in school settings. Although the successes are shown here, there were failures along the way. Behavior modification is not a panacea or a laboratory experiment. It is a tool that growing numbers of teachers are finding appropriate and useful in certain situations.

Let's look in on Susan Erdman, second-grade teacher. Although Miss Erdman likes teaching, and thinks she has a good class, she'd be the first to admit that today was a bad day.

"Rickie, sit down!"

Wiggling and jiggling, 7-year-old Rickie doesn't sit still for 2 minutes. For the umpteenth time he jumped up and ran around the room until Miss Erdman wearily reminded him to return to his seat, which he did. Although Rickie's IQ is 110, the achievement tests place him at a first-grade level in reading and arithmetic. He seldom finishes a task, and what he does accomplish is often incorrect and sloppy. Miss Erdman had a conference last week with Rickie's mother. She learned that his father is away in the army, there are two younger children at home, and his mother feels unable to cope with Rickie's hyperactive and disruptive behavior. She told Miss Erdman, "Rickie hasn't got a mean bone in his body. When he's alone with me he's no trouble at all, but as soon as he gets around other children he just goes wild."

"Did you hear what I said, Mary?"

Mary, though she presents no obvious behavior problems in class, is perhaps the most frustrating child in Miss Erdman's class because nothing seems to get through to her. Tests indicate she has an IQ of 97. She reads at a preprimer level, doesn't complete any of the assigned arithmetic problems, and seems interested in one thing only, the hamster cage in the science area. Miss Erdman tried to do some after-school tutoring with her in arithmetic, but Mary was so unresponsive that Miss Erdman gave it up. When the teacher calls on her, Mary averts her eyes. If pressed to answer, she often mumbles and bites her lip. This afternoon it seems to Miss Erdman

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[1] *Behavior modification* is the researchers' term used throughout this document to mean a change in the accustomed mode of behavior resulting from learning. See Glossary on p. 30 for definitions of other words used.

that Mary even cowered when she was called upon. Miss Erdman's attempts to arrange a conference with Mary's mother have failed; she understands there are several other children in the family and perhaps school conferences are not possible.

"Bill, I'm going to send you to the principal's office."

Having repeated first grade, 8-year-old Bill is the oldest and largest boy in the class. He's the ringleader of a group of boys who, both in Miss Erdman's class and on the playground, frighten other children with aggressive acts and threats. Bill has spent more time in the principal's office than any other child in the class, but the experience seems to have had little positive effect on him. Miss Erdman has heard complaints that Bill and "his gang" have been waylaying other youngsters on the way home from school and taking their money. This afternoon, when she called on him, Bill grinned, raised his eyebrows, and stuck out his tongue. This behavior drew quite a laugh from the other children. In response to a reprimand from Miss Erdman, Bill clenched his fist and said, "I'll get *you*!" Reluctantly the teacher sent Bill to the principal's office once again.

* * * *

Indeed, it was a bad day. After thinking over the day's occurrences, Miss Erdman went to the teachers' lounge where she found Dick Phillipi, a sixth-grade teacher; Cecelia Moore, a third-grade teacher; and Betty Davidson, who has taught fourth grade at the school for many years. As frequently happens in the teachers' lounge, they were discussing their problem students. Dick Phillipi said he was thinking of suspending a boy for fighting on the playground. Cecelia Moore was in despair over David, a very bright boy in her class who already knew certain advanced algebra concepts--taught by his father. However, the boy refused to learn the multiplication tables, preferring to calculate his answers in ingenious but time-consuming ways. Susan Erdman sighed deeply and told the others about her problems with Rickie, Mary, and Bill.

"Sometimes I feel I'm a baby sitter instead of a teacher," she concluded. "I spend half my time getting the children to pay attention."

"Our problems are pretty typical of teachers' problems today," Betty Davidson said. The way I look at it, we're being forced to discover new ways of teaching, more effective ways. I think we ought to try a new approach here, in our own classrooms. I'm thinking particularly of behavior modification."

"Oh that," Dick Phillipi said, half teasingly, half seriously. "Manipulation, you mean. Kids just simply aren't rats."

"Of course not," replied Betty. "But behavior modification isn't that different from what we do already. It's just a systematic way of going about it. You note what a child does, *what he actually does*, like raising his hand, or writing an answer, or talking out in class; and you encourage his productive efforts while at the same time you discourage his unproductive responses."

Susan Erdman looked puzzled and Betty Davidson explained further: "It's based on the scientific theory that behavior is influenced by its consequences. We as teachers are influencing children all day long. Why not analyze our behavior and their responses, then, to find out what produces positive results rather than negative ones?"

"I guess I'm slow or tired this afternoon, "Susan said, "but I still don't understand."

"Think of it this way, "Betty said. "Rickie jumps up from his seat, and you tell him to sit down. He jumps up again and you reprimand him again. This goes on and on--Rickie hopping up and down, you becoming more and more irritated. But what reaction does Rickie get *when he's sitting in his seat?*"

Cecelia Moore interrupted. "You can't say something to a child every time he's sitting in his seat."

"But you can be selective," Betty said. "Praise for sitting rather than reprimands for jumping up may prove more effective. Susan might want to try it. Anyway, how would each of you feel about reading the material I have and then letting me know what you think? I intend to use this approach and, if you're interested, we could try it out together."

Susan Erdman and Dick Phillipi were willing to give it a try.

"Not me," Cecelia said. "I've had too many courses and, besides, I don't have any discipline problems."

Betty reminded Cecelia about David and his multiplication tables.

"That's not a discipline problem," Cecelia answered.

"This behavior modification approach isn't designed just for discipline problems," Betty replied. "You can provide a way to encourage David's creativity at the same time he learns multiplication and thus reduce the risk of turning him away from school at this point. Wouldn't you be willing just to give it a try?"

Some Principles of Behavior Modification

The three teachers read the resource materials Betty Davidson provided, including a sampling of the materials listed in the bibliography. Together they developed the following principles:

Behavior is influenced by its consequences.

Like most basic ideas, this one seems simple. It means that what you do is influenced by what follows what you do. Behavior that is rewarded tends to be repeated, while behavior that is not rewarded is not likely to be repeated. This basic principle has been expressed under various names including positive feedback, reinforcement theory of learning, operant conditioning, behavior modification, and precision teaching. This approach means that you deal with a pupil's here-and-now actions, only those behaviors that you can see and objectively record. You must define a behavior in operational terms (stating a "behavioral objective") before you determine how often a behavior occurs and the consequences of that behavior. Such data help to provide a more scientific approach to decisionmaking in teaching. Intuition, creativity, experience, values, and attitude comprise the art of teaching. However, like good medical practice, good teaching is a combination of the science of learning and the artistry of teaching.

Teacher's behavior influences pupils' behavior.

a. *Reinforcement.* Wittingly or not, teachers influence many of the consequences of their pupils' behavior. They give grades and stars, smile and frown, praise and criticize, ignore and reward. By providing certain kinds of consequences, teachers can influence or modify their pupils' behavior. They can increase the occurrence of desired behaviors and decrease the occurrence of those which are not desirable. You and only you can decide which behaviors you want to attempt to increase or decrease. The methodology of behavior modification has no inherent value orientation. Each teacher can personalize the approach he uses to coincide with his value orientation and judgment with regard to influencing children's behavior.

(1) *Positive Reinforcers.* These include smiles, pats, winks, verbal approval, tangible rewards, earned points and stars, and the appreciation of peers. They are intended to encourage productive behavior. The only way to know if a reinforcer is positive is to observe its effects on the behavior that follows. If it increases the strength of the desired behavior, it is a positive reinforcer. Keeping individual differences in mind is important. One pupil may beam with pleasure when the teacher says, "I'm proud of you," while another may cringe at the same words. In judging the effectiveness of what *you* regard as a positive

reinforcer, it is important to be attentive to the observable behavior of the child.

(2) *Punishing Consequences and Negative Reinforcement* may be used to deal with unproductive behavior. Social disapproval of various kinds is a potent type of negative reinforcer, but its specific effects vary with the characteristics of different groups of children. A problem with punishment is that, while it may cut down on questionable behavior, it doesn't necessarily create productive results. When punishment (a scolding, criticism) is used, it can be a double-edged sword because often a child's desire for attention is greater than his dread of punishment. Then, too, what the teacher expects to be a punishment may prove to be a positive reinforcer instead--for instance, the child who becomes a hero to his peers when he is scolded.

b. *Timing of Reinforcement.* The more promptly reinforcement follows an act, the more effective it will be. A teacher who walks about the classroom attending to the pupils and commenting on their work is more effective than the one who waits to comment at the end of the study period. Feedback and grades received immediately after the completion of work are more effective than those received a day or week later.

c. *Shaping.* One way of stating this principle is to say a big behavior is made up of many smaller behaviors. As you set forth to change a child's academic or social responses, you must recognize behaviors that are first approximations in the direction of the target behavior you are after. When a child doesn't make a desirable response that can be reinforced, approximations to the behavior can be reinforced instead. For example, a child who disrupts the class by singing loudly can be positively reinforced for humming softly. This may seem somewhat "unfair" because even soft humming when the class is engaged in other tasks is not conducive to a productive classroom atmosphere. Yet, a gradual shaping process characterizes most of human development. Skillful and patient shaping can utilimately prove to be highly effective.

d. *Satiation.* Continued reinforcement of the same kind may lose its effectiveness. In that case, it's time to try another approach. For example, you can change the stimulus materials (a different book) or the reinforcer (stars instead of free time). But *you should change only one thing at a time or you won't know what is bringing about improvement.*

e. *Schedules of reinforcement.* Once behavior has been established it is more effective to give the reinforcer only *some* of the time rather than every time. If the child never knows whether the reinforcement is coming, he won't be disappointed on the one hand or bored on the other. The time to shift to partial reinforcement is *before* the

reinforcer has lost its power. An advantage of intermittent reinforcement is that the child tends to sustain his appropriate responses while the frequency of "pay off" is being reduced. By using intermittent reinforcement skillfully, you can avoid the pitfalls of the child's deciding the game is over and/or his resenting dependency on an arbitrary giver or withholder. In addition to a 100 percent schedule, there are many other types of reinforcement programs. Reinforcements might be given 25, 50, or 75 percent of the time. They might occur after a certain number of correct responses or after a particular time period (for example, after 10 minutes of nontroublemaking). When a positive reinforcer is withdrawn, the frequency or magnitude of the reinforced response usually shows a decrement.

f. *Extinction.* In some cases, simply ignoring unproductive behavior is effective in extinguishing it. That is, nonreinforcement of a given behavior tends to lead to its extinction.

The How-To of Behavior Modification

Before starting trial runs in their own classrooms, the four teachers decided to outline step-by-step what they were going to do. They organized what they had learned into the following five steps:

- Establishing reasonable and ethical goals which fit their personal value orientation and which were clearly defensible ethically.
- Making specific, clear, and fair rules for the class with real consideration for the "input" of pupils.
- Observing and recording behavior.
- Increasing productive behavior.
- Decreasing unproductive behavior.

Establishing Reasonable and Ethical Goals

Miss Moore thinks it would be wonderful if all the children in a classroom sat still and paid attention, did their work, and did it on time. But could this possibly be?

Disruptive children can be managed, but if behavior modification is used to make children conform to a rigid idea of goodness or to squelch creativity or to force sterile compliance, the cost of an orderly classroom may be too high.

You and only you can decide what is reasonable and ethical when you set educational goals for your class. Before inaugurating any kind of program for the children you teach, ask yourself:

- What kind of student behavior interferes with the learning of the rest of the class, and what is perhaps annoying, to you, but essentially harmless to the learner and his peers?
- How much classroom freedom can be permitted without interfering with the rights of other students? On the other side of this coin, what are your responsibilities and the responsibilities of the students?
- Should silence be maintained while children are working or should

reasonable communication among students be permitted? How can you best define your standards in terms the children will understand?

- Are your classroom regulations really for the benefit of the students...or primarily for your own comfort and convenience?
- Are you thinking of how the disruptive child can be helped to learn better, not just how his disruptive behavior can be decreased?
- Before you decide to use punishment, have you exhausted the positive possibilities?
- What evidence do you have that your methods help children learn and positively influence their behavior?
- How much variance is desirable in classroom work? Is a particular student's answer really incorrect or is it actually *original?*
- Have you been able to maintain an attitude of openness to new ideas and approaches which can benefit children even though they do not coincide with your personal biases?
- Have you considered the attitudes and standards of the child and his family in setting standards for the child? Are your standards in conflict with theirs?
- Have you discussed your goals *for* the class *with* the class?
- Have you discussed your goals *for* the child *with* the child and his parents?

Some people say using reinforcers to strengthen productive behavior and weaken unproductive behavior is "playing God." This is true only if you use reinforcers to try to impose your own arbitrary standards. That might be "playing God" and it's unlikely to work anyway.

One advantage of a reinforcement approach to teaching is that it encourages you to set specific behavioral objectives and to insure that decisions are based on data objectively collected, using methods that are open to inspection. These are not secret, locked-door techniques. The more you involve the children and their parents in your plans, the more objective and effective those plans are likely to be. The happiest results occur

when everybody gets into the act, when the rules are clear to all and the teacher is consistent in his procedures.

Making Class Rules

Some teachers feel that this approach does not fit their style, while others consider it a productive technique. Often a class can participate fully in making its own rules for conduct and the reinforcers that apply to it. The rules can be cooperatively derived, posted in a conspicuous place, and used as a group learning experience. Even first-graders can have a share in devising their own rules, and appropriate picture cut-outs can serve as the posted class rules. Here are a few guidelines to follow:

- Keep the rules short and to the point so they can be memorized. ("At your desk when the bell rings.")

- Five or six rules are enough, fewer for younger children. Rules for special occasions generally can be discussed when the time comes. Start out with only one or two rules and add others gradually. Remember the principle of shaping--modify the rules gradually from simple to complex.

- Try to phrase the rules positively. ("Sit quietly while working" rather than "Don't talk while working.")

- Review the rules with the class at times other than when someone has misbehaved. Call attention to positive examples of observing the rules.

- Test the clarity of the rules by having one child explain them to another, or prepare a group test that covers the scope of the rules.

Observing and Recording Behavior

Observing behavior is a crucial first step in strengthening productive activity. It isn't enough simply to say, "Jerry is disruptive." What does Jerry do that you have designated as a disruption? Is yours a definition of an action that is precise, reliable, and objective?

Once you have identified a specific behavior, the question arises: How often does it occur? By keeping an objective record of a child's behavior from the time the unproductive activity is identified and observed until after you have changed it, you are able to gauge your effectiveness.

There are several ways of recording specific behavior. Typically, the teacher must keep his own record. Or, on those occasions when another teacher or counselor is available, have your colleague record the behavior

in which you're interested. Some teachers have recruited parents or college students to be classroom recorders. The children themselves can record certain behaviors. Having a child measure his own behavior sometimes contributes effectively toward changing it. With older children, one or two of them can record class behaviors, such as in seat on time, on a daily chart. Some teachers use wrist counters like those used by golfers to do their own recording. Many teachers have devised unique recording forms that, in well-sequenced stages, move the recording task from the teacher to the children. This increases the students' potential for self-direction. A piece of masking tape on a child's desk is a convenient way for either the teacher or child to make a record; each time you initiate contact with the child at his seat you can mark it on the tape.

No matter which method you use to record, one instance is not enough. You need to record regularly, perhaps in 15- or 30-minute periods, over a period of several days, perhaps even as long as 2 weeks. This is necessary to establish a baseline, or departure point. It will be difficult to tell what effect *your* behavior is having on the youngsters if you don't have a record that describes the frequency of the behavior you wish to modify.

Later, as you institute techniques to improve the situation, you will want to record again to see if your approach does in fact change the behavior in question.

There are four distinct periods in making a behavior modification chart:

- *Baseline period.* At what rate does the unproductive behavior occur before you introduce reinforcers in the classroom? Once you've decided to help a youngster modify his behavior, you'd like to get on with it. But first you must patiently observe and record his current actions or you won't know what you've subsequently accomplished. A baseline is usually taken for several days or weeks in order to allow for day-to-day variations and to derive reliable estimates of the frequency and intensity of behavior.

- *Reinforcement period.* Does the desired behavior increase and undesirable behavior decrease when you give reinforcement (attention, praise, rewards)? Remember, use one kind of reinforcement at a time for one specific behavior. You don't want to confuse things now, after all your work.

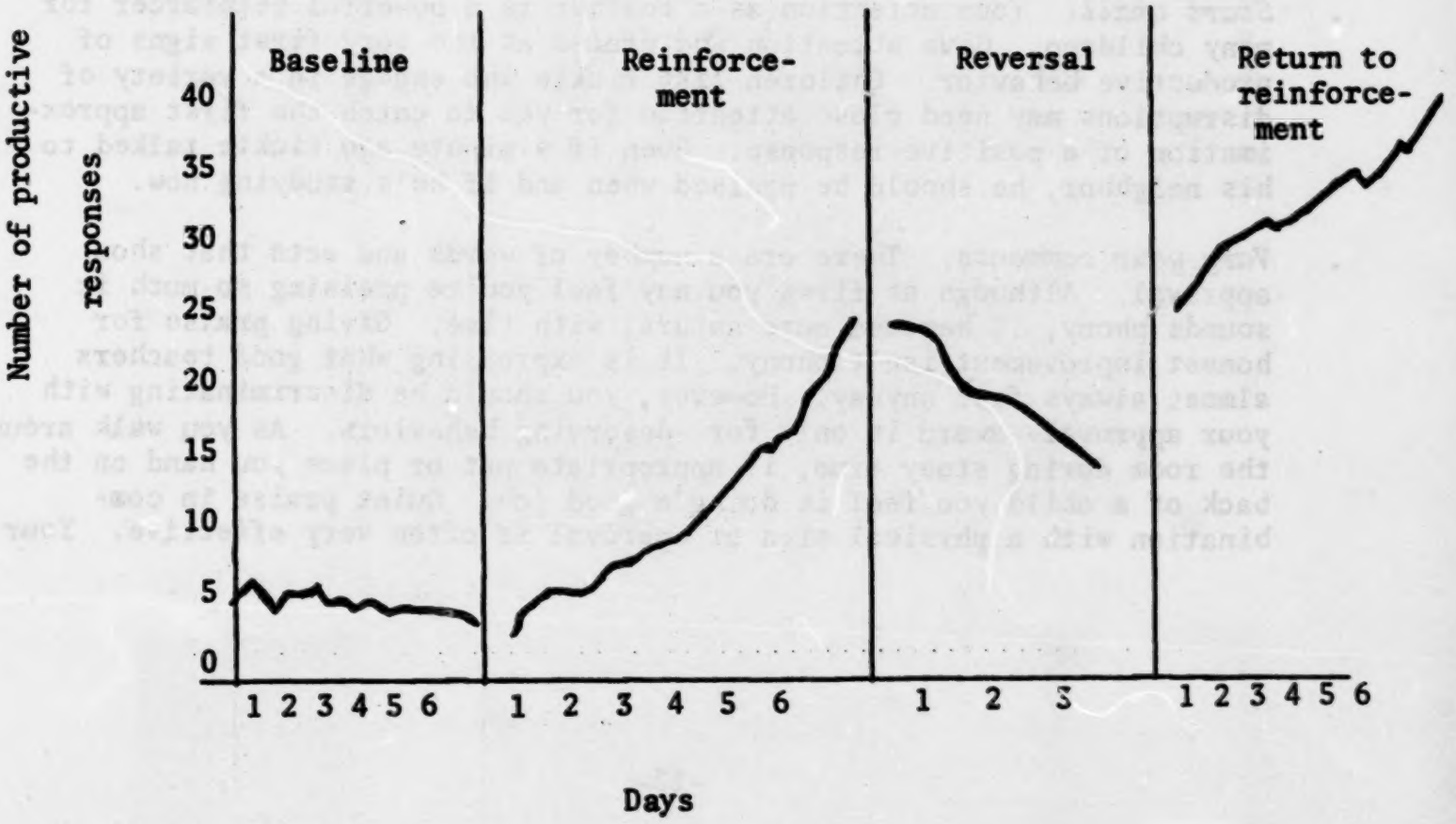
- *Reversal period.* Is improvement in the pupil's behavior due to the

specific reinforcers? Or is it due to some other factor such as influences at home or a different lesson plan? To check these possibilities, discontinue the application of the specific reinforcement for a short period of time. When this is done, undesirable behavior usually increases and desirable behavior decreases. Now you will know for sure whether or not the reinforcement program was effective.

. *Return to the reinforcement period.* The return to reinforcement will probably reinstitute the productive level of activity.

Figure 1 shows a hypothetical chart of the effects of reinforcement on productive behavior (for example, the number or percentage of assignments completed on time). During the baseline period, productive behavior (paying attention, cooperating, work) is relatively low. Reinforcement (verbal praise by the teacher) greatly increases its occurrence. When verbal reinforcement by the teacher is withdrawn (reversal) the child's productivity declines. Return to reinforcement reverses this trend.

Fig. 1--The Effects of Reinforcement on Productive Behavior



Charts such as figure 1 can help a teacher keep track of a specific behavior of a particular child (for example, the rate of correct responses to arithmetic problems). They can be used to record productive responses (such as studying) or unproductive responses (such as fighting). In day-to-day classroom situations the teacher is seldom interested in carrying out the reversal phase. However, when it is feasible to do so, carrying out a reversal procedure can help the teacher see clearly what impact is exerted by a reinforcer on the pupil's behavior.

Increasing Productive Behavior

- *Catch the children being productive.* This is the crux of the matter. You may use masking tape on the child's desk to record when you praise him for being *in* his seat. Be a "yea sayer." Your new motto might well be: "Accentuate the positive."

- *Point out productive behavior for the class.* Try to praise the children who are paying attention. Attend to those who are sitting in their seats, doing their work in a nondisruptive manner. "That's right, John, you're doing a good job." "You watched the board all the time I was presenting the problem. That's paying attention." "That's a good answer. You listened carefully to my question." These responses not only reinforce the child to whom they're directed, but they also help to provide the rest of the class with an explicit idea of what you mean by paying attention and working hard. Young children, especially, pick up cues of this sort and learn to model their actions after the positive examples established and noted by the teacher. One caution: unless deftly administered, public praise can be embarrassing rather than reinforcing for some children.

- *Start small.* Your attention as a teacher is a powerful reinforcer for many children. Give attention and praise at the very first signs of productive behavior. Children like Rickie who engage in a variety of disruptions may need close attention for you to catch the first approximation of a positive response. Even if a minute ago Rickie talked to his neighbor, he should be praised when and if he's studying now.

- *Vary your comments.* There are a number of words and acts that show approval. Although at first you may feel you're praising so much it sounds phony, it becomes more natural with time. Giving praise for honest improvement isn't phony. It is expressing what good teachers almost always feel anyway. However, you should be discriminating with your approval--award it only for deserving behaviors. As you walk around the room during study time, if appropriate pat or place you hand on the back of a child you feel is doing a good job. Quiet praise in combination with a physical sign of approval is often very effective. Your

approval is one of the most powerful reinforcers available in your classroom and should be distributed judiciously for appropriate responses of children.

. *Devise individualized effective reinforcers* for each of your pupils. This may not be simple--it will require considerable ingenuity on your part. Each of your youngsters is different, and what may be enjoyable or rewarding for one is not necessarily so for another. Observing what the child does when he can freely choose can give you ideas for positive reinforcers.

Some examples of positive reinforcers are:

. Praise and attention from the teacher.

. Approval of peers.

. Parental approval. Sometimes parents can be great allies. When a certain goal is reached, the father may take his son fishing, or the mother may take her daughter on a shopping trip. Arrangements such as these can be made in a simple contract.

. Earning points toward a desirable goal.

. Honors and privileges.

. Tangible rewards such as food, trinkets, or other prizes.

Social reinforcers don't work for all children, in which case tangible rewards may be necessary to start the ball rolling. If tangible reinforcers are accompanied by praise, the praise may in time become a reinforcer.

. *Try contingency contracts.* Sometimes teachers and pupils can work out contracts or formal agreements. The standards set down in a contract should not be too high and the rewards not set at too great a distance. "Get 10 of the arithmetic problems correct in 10 minutes and the group can play kickball at recess." This time-tested technique was probably used by Aristotle when he tutored Alexander. The contract format and content are limited only by your ingenuity. There is considerable potential reinforcement value in things teachers usually give away such as movies, recesses, and parties. In one study, classroom noise was markedly reduced when the teacher and her pupils agreed upon a contract that permitted two additional minutes for the gym period if the sound level was kept at an established low level.

Decreasing Unproductive Behavior

- *Ignoring.* Nonproductive responses are often attention-getters. Although it's difficult to do at first, ignoring disruptive behavior often can be very effective in extinguishing it. The ignoring principle is an example of the principle of extinction--applying it helps eliminate nonproductive responses. A good deal of behavior is not so disruptive that it needs to be stopped at once. Any behavior that does not threaten the safety of another pupil usually can be ignored.

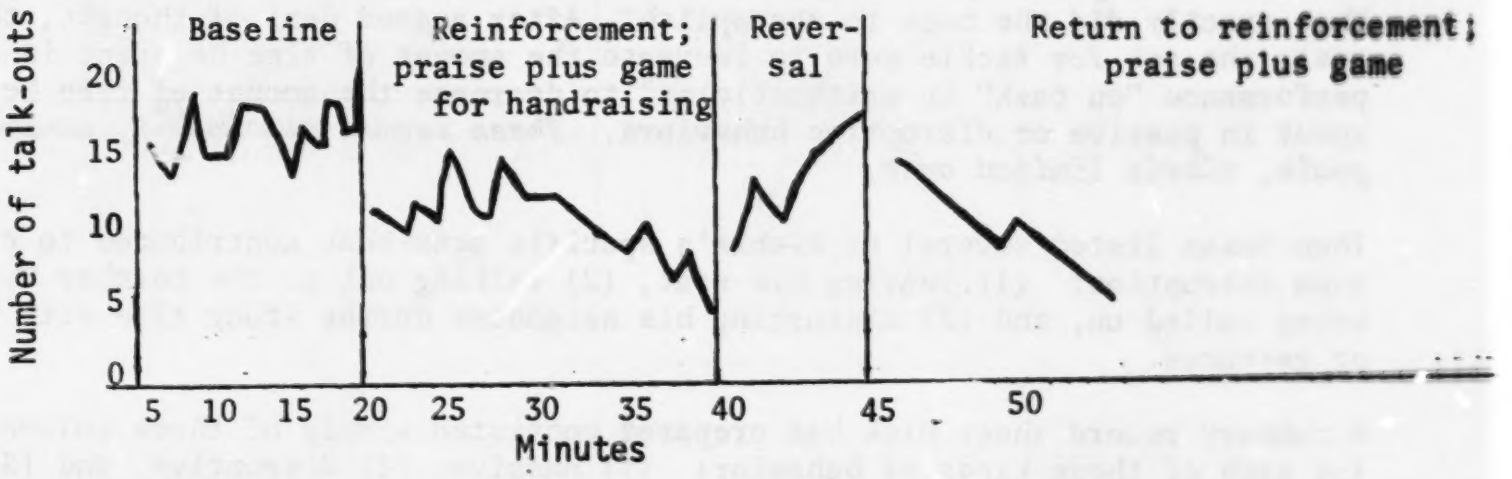
  By telling a child to sit down you may unwittingly reinforce his getting up. He may want your immediate attention and standing up is the kind of behavior that gets it. If you wait until he is sitting down and praise him for *that*, the times when he gets up are likely to decrease.

- *Isolation.* Some behavior cannot be ignored. The class should know what behavior is clearly out of bounds. It should know, for example, that hitting another child or open defiance of the teacher or loudly disruptive temper tantrums will result in isolation or expulsion from the classroom. Stipulations concerning the conditions under which isolation will occur could be part of the teacher-pupil contract. When a child is isolated, he should be left alone without attention in a safe and secluded place--perhaps the nurse's or counselor's office, or perhaps a "time-out" quiet place in the classroom. For elementary children this is a severe blow and should be used with caution. Isolation is often effective when it is applied swiftly and for a short period of time.

- *Looking for the positive.* Punishment, isolation, or exclusion are techniques intended to stop destructive behavior in its tracks. However, ignoring the negative and accentuating the positive should always be given serious consideration. One way of doing this is to reinforce desirable behavior positively at once, particularly when it substitutes for the undesirable behavior. Figure 2 shows how this was done with regard to talking out during class. The subjects were first-graders in a poverty-area school. During the baseline period, prior to the experimental procedures, the frequency of talk-outs was high. The reinforcements used were praise and the opportunity to participate in a game if the child raised his hand to obtain permission to speak. With reinforcement there was a noticeable decline in talking out. However, during reversal, a return to baseline conditions by withdrawing praise and the opportunity to play a game for not talking out, talking out increased. Return to

reinforcement led to a reduction of this type of disruptive behavior. It is apparent that the "pay off" of a game plus the teacher's approval were effective in bringing talk-outs under control. However, not all disruptive behaviors yield at once to such modification techniques; hence, the teacher must systematically and creatively vary the classroom materials and environment, the type of reinforcers, and the schedule of reinforcement.

Fig. 2--NUMBER OF TIMES PUPILS TALKED OUT DURING A 1-HOUR ACTIVITY AND DISCUSSION PERIOD



(R. Vance Hall et al. "Modification of Disputing and Talking-out Behaviors with the Teacher as Observer and Experimenter." Paper presented at the meeting of the American Educational Research Association, Minneapolis, March 1970.

* * * * *

A general caution on the "how-to" of behavior modification is: *Don't try to do too much.* By attempting too many changes at once you can fail to achieve any of them. Difficult problems should be discussed with someone who has had experience in this kind of technique. Look to resource materials and knowledgeable consultants for specific suggestions. The consultant will be in a far better position to help you if you have operationally defined, observed, and recorded samples of the behavior about which you are concerned.

Putting Principles Into Practice

Now that the teachers had boiled down some of the how-to of behavior modification, they agreed to work in pairs so they could help each other get started. While Dick Phillipi's youngsters were supervised on the playgound, he was to spend 15 minutes in Susan Erdman's classroom during her reading group sessions so he could objectively record Rickie's behaviors. In the afternoon after her second-graders had gone home, Susan was to record the behavior of one of Dick's students.

Rickie: Ignoring Disruptive Behavior

Susan decided to start with Rickie who, in her opinion, presented the most constant disruption to the class. What were her educational goals for Rickie? What exactly did she hope to accomplish? After a good deal of thought, the goals she set for Rickie were to increase the amount of time he spent in action performance "on task" in arithmetic and to decrease the amount of time he spent in passive or disruptive behaviors. *These seemed attainable, concrete goals, albeit limited ones.*

Then Susan listed several of Rickie's specific acts that contributed to classroom disruption: (1) leaving his seat, (2) talking out to the teacher without being called on, and (3) disturbing his neighbors during study time with words or gestures.

A summary record sheet Dick had prepared consisted simply of three columns, one for each of these kinds of behavior: (1) passive, (2) disruptive, and (3) "on task." (In the "passive" column Dick kept track of when Rickie was not disturbing others, but was also not attending to his work.) During 15-minute-by-minute time periods, Dick recorded instances of Rickie's behavior that fell in each of the categories. He also kept track of Susan's reactions to these types of behavior. After several days, Susan looked over what Dick had recorded. On the average, Rickie was disruptive nine times in 15 minutes. Susan could see that Rickie's disruptions occurred in clusters. When he was out of his seat he usually combined this with calling out to her and touching or speaking to other children.

Susan and Dick agreed that she had very frequently "dispensed" attention to Rickie when he was disruptive. Now Susan was ready to begin her new approach to Rickie. It sounded simple enough--to ignore him when he was disruptive, and to "catch him being good" when he was paying attention. But would it work?

Dick continued to come in each day to keep track of what Susan did, or didn't do, as well as to record what Rickie did. He recorded when she ignored Rickie or

reprimanded him when he jumped up, talked out, or disturbed others. He also kept track of when Susan praised Rickie or smiled at him for sitting still, paying attention, or working hard.

After the first few days Susan was discouraged. Though she tried very hard not to react to Rickie when he jumped up from his seat, Dick's records showed she told Rickie to sit down about half the time and she kept forgetting to "catch" Rickie paying attention. When he was quiet she tended to ignore him and concentrate on the other children. Dick's records showed little change in Rickie's "on task" behavior. "He probably can't help himself," Susan thought. "Maybe his behavior is physiological, and what he really needs is medication."

But she chided herself for giving up so easily. She hadn't succeeded yet in changing the pattern of *her* behavior, so how could she expect Rickie to change?

Susan decided to rearrange the reading group sessions so she could spend more time walking around the classroom while Dick was there to record. That way she could keep Rickie in view more easily without his constant awareness. She began to get in the habit of smiling at him and complimenting him when she saw him with his head bent over his book. His ready smile when she praised him made her realize she was on the right track.

In time, Susan found it easier and easier to remember to praise Rickie for working hard or paying attention. Perhaps he was reinforcing her as much as she was reinforcing him. She got the knack of calling on him when he was not talking out. It seemed to her Rickie was being much less disruptive, and Dick's records bore this out. Susan had increased her appropriate positive responses to Rickie from 5 to 25 percent and this apparently helped Rickie to increase his "on task" behavior from 30 to 65 percent. This was objective evidence that she was on the right track.

"But I can't keep this up forever," she said to Dick. "I'm still not doing anything for Mary, because my mind is so much on Rickie."

Dick suggested that it might be time for a different approach, and Susan decided to institute a system of colored stars on a chart which she placed on Rickie's desk. Each 15-minute period Rickie spent without getting up, talking out, or disturbing a neighbor would earn him a blue star. Four blue stars rated a gold star, which he carefully placed on his chart. Five gold stars would be exchanged for a special treat. Rickie, who loved attention, might like to carry a message from the teacher to the principal in return for an entire day of paying attention.

During the time Susan had been learning to ignore Rickie's disruptive acts and praise his efforts to pay attention, she found it easy to apply a similar approach to other children in the room. She was touched by how quickly the children responded to her smiles and words of praise (positive reinforcement).

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Even tough Bill had ceased his classroom threats, not because she ignored them, but because she used one of Dick's ideas and followed every threatening remark of Bill's with swift isolation. She had persuaded the school nurse to let her use the nurse's office for effective isolation purposes. Whereas Bill had enjoyed the attention from the principal when he was sent to the principal's office, he did not enjoy the isolation of the nurse's office.

Mary: Increasing Reading Achievement

Susan decided the time had come to find a way to reach Mary. What would be a good set of educational goals for her? Clearly, one goal would be to improve her reading skills. Another would be to have Mary participate more in class discussions and activities. For a week Susan recorded as Mary painfully tried to read. She noted the correct responses as well as the number and types of her errors. At the end of a week, she tallied the record and found that Mary averaged 16 words a minute read out loud from the preprimer, with 10 errors per minute.

Having established a baseline, Susan began her efforts to reinforce Mary. She realized social reinforcement wasn't effective with Mary, but she had no other ideas. Perhaps she should try talking with Mary. She began by asking Mary if she had any brothers or sisters. Mary's mumbled reply was almost impossible to understand. Then Susan asked the child what she liked to do after school. Mary turned her head away and didn't answer at all. Suddenly Susan noticed that Mary was looking at the hamster cage near the windows. Chatting casually, Susan walked toward the hamster cage. Mary followed silently.

"Would you like to hold the hamster?" Susan asked.

Mary nodded. Susan opened the cage and gently handed the hamster to her.

This was a reinforcer worth trying, Susan decided. By having Mary earn points through reading improvement, and trading these points for earned time spent with the hamster, she hoped to reinforce Mary's reading skills.

For a week she listened to Mary read for 10 minutes each reading period, recording both the number of words read correctly and the errors. She continued praising Mary for each correct word, but at the same time she also handed Mary a red poker chip. Each red token earned 1 minute with the hamster.

At the end of the first week Mary's reading rate had increased from 16 correct words a minute to 25, and the errors had dropped from 10 to three per minute. Mary kept the tokens in a box at her desk. Her teacher discovered an unexpected side benefit when Mary's performance in arithmetic suddenly improved.

Mary's reading rate continued to improve; she moved up to a primer and then a first-grade reader. She was reading in the beginning second-grade reader at the rate of 20 correct words a minute with one error when her improvement rate came to a grinding halt. A week passed and the rate was the same. At the end of another week Mary's rate of reading dropped slightly. Susan realized that a satiation point had been reached. Mary seemed tired of tokens. Actually, it was simply that she was losing interest in the limited play with the hamster. Susan could have sought a more novel back-up for the tokens. However, she decided to try a contract with Mary. If she advanced to the second-grade reader by the end of the school term, she could keep the hamster at home over the summer. Susan wrote a note to Mary's mother to tell her how well Mary was doing and to try to set a time for a conference so that they could talk these plans over.

Susan had included her home phone number in the note, and Mary's mother called her that evening. It was clear that the mother was not unconcerned about the child, but was too burdened to do much about it. The fact that Susan initiated contact with her about something positive Mary could do made it easier for the mother to ask for help.

Susan explained how Mary earned tokens for reading improvement which could be exchanged for time with the hamster, and how much Mary's reading had improved at first, but that now the improvement had stopped, even dropped off. She said the hamster wasn't as much of an inducement to Mary as it had been.

Mary's mother laughed. "Isn't that something!" she said, "Mary's learning to read so she can play with the hamster. Now you need something new? I know just the thing. Our neighbor's dog has pups and Mary wants one. But I haven't said yes to her yet."

"Could you promise Mary the puppy will be hers when she finishes the second-grade reader?" asked Susan.

"Sure, I can do that, if you think it will help Mary."

Susan smiled to herself after she hung up. She was glad she'd been persistent in getting in touch with Mary's mother. Of course, maybe it wouldn't work out. Maybe the puppy would be given away to someone else or maybe Mary would persuade her mother to let her have the puppy ahead of time. But these were part of the human uncertainties, Susan thought. She had to trust Mary and her mother, just as they had to trust her.

LeRoy: Isolation Aggression

In the teacher's lounge one day, Dick Phillipi told his colleagues about the

unexpected trouble he'd had with LeRoy, his playground fighter.

"Behavior modification sounds simple until you really try it. I figured the thing to do with LeRoy was to send him home when he got into fights. I had a conference with him and his parents. They are very cooperative people, too cooperative as it turned out. We all agreed, LeRoy included, that LeRoy simply couldn't continue fighting at school, and I thought things were under control.

"The first day or two, LeRoy stuck with the contract he'd make, but before the week was over he was back to slugging it out with anyone he could find. So I promptly sent him home, as we'd planned. The next day, LeRoy was fighting again, and I sent him home again. His attitude seemed kind of smug."

"He'd out-maneuvered you," Cecelia Moore said, "getting out of going to school."

"It wasn't that," Dick said. "LeRoy likes to be around other kids, and at home there's no one to play with. I was sure isolation would work, but there was one thing I didn't know about. His father is a plumbing contractor, and whenever LeRoy went home, his father, not wanting him to be running loose or restless, took him out with him on his jobs. LeRoy loved it. No wonder he didn't care if he were sent home from school. He was being positively reinforced for fighting on the playground!"

Cecelia shook her head.

"Actually, it's turning out okay," Dick said. "I blame myself for not making it clear when I met with his parents just what we were trying to achieve. I've talked with his family again, and his father has stopped rewarding LeRoy for getting into trouble at school--something he'd had no intention of doing, of course. Furthermore, LeRoy's father has come up with a positive reward by permitting his son to help him after school *if* he didn't get into fights and *if* his school work was not acceptable but actually good. The boy hasn't had a playground fight for 3 weeks now and he seems more interested in what is going on in class."

David: Encouraging Creativity

"What about you, Cecelia?" asked Susan. "What's happened with the boy you were telling us about, the one who could do algebra but didn't know the multiplication tables. What's his name?"

"David." Cecelia replied. "He really gets on my nerves. Yesterday I had to keep him after school for the second time this week to finish his arithmetic. It's hard for me to feel sympathetic with him, when I think of other children in the class who really have to work hard to learn their multiplication tables, while David could do the work so easily, but just won't."

"Sometimes I think bright youngsters have just as much of a problem with school as slow ones," Susan said. "Certainly bright children need just as much patience and creativity on the part of teachers."

"David's already overly impressed with how bright he is," Cecelia said. "His father sees to that, teaching him algebra."

Dick spoke up. "Have you talked to David's father about it? Maybe you could enlist him to induce David to memorize the multiplication tables."

"I wouldn't count on it," Cecelia said. "All he's interested in is algebra."

"Maybe he doesn't realize David's falling behind in the basic arithmetic process," Dick said. "He certainly would want his son to be able to multiply.

Cecelia pointed out that David could multiply. Susan and Dick looked at each other. Then Dick said, "How *does* David multiply?"

"He adds and subtracts." Cecelia said. "For example, if the problem is 6 times 9, David counts six 10's as 60, then subtracts 6 from that."

"Really?" Susan said. "That sounds very ingenious."

"David's smart enough," Cecelia replied. "I told you that. But he won't follow directions, and he insists upon doing things his own way."

"Cecelia," Dick said. "I have an idea. David needs to be given more challenging work. Why don't you make a contract with him? If he memorizes the multiplication tables, and you can give him a test to complete in a certain time, then he can do other problems he makes up. Maybe he shouldn't have to memorize them at all if he gets the right answers just as fast doing it his own way."

"But--," Cecelia hesitated.

"Maybe his father has some mathematics puzzle books at home," Susan said, "Something David's keen on. There must be material that's more challenging for David than the regular arithmetic book."

Susan and Dick waited for Cecelia's reply. She had a thoughtful expression on her face. Then she said, "I think I will talk with David's father."

A few days later Cecelia told Susan and Dick about her conference with David's father. "He was a very understanding man," she said. David was there during

our talk and it's obvious he adores his father. We made a contract with David that as soon as he could do the entire multiplication table in 10 minutes--without any errors!--his father would take the class on a tour of the aircraft factory where he works as an engineer. They usually don't allow young children, but his father is making all the arrangements. Won't that be a wonderful field trip and a great reward?"

While Cecelia and Dick continued to talk, Susan leaned back and thought about the last several weeks and the different kinds of problems they'd all tried to solve. She'd been lucky. Most of her plans had worked out well. Of course, she'd had a lot of help from parents and other teachers. Even so it hadn't been easy. Every time she'd thought she had a final solution, something new cropped up. That's the way it is with people, she thought; often they don't fit into anyone's ideas of how they ought to be. Keep your plans flexible, she decided, always open for the human element.

Four Classroom Case Studies

Here are a few cases culled from professional journals in which the ideas reviewed here have been applied in classrooms throughout the country.

Case 1. Getting Children to Attend to Academic Tasks [2]

Jim Randall, a newcomer to teaching, was assigned a class of 30 sixth-graders in a public school located in a rundown, low-income neighborhood. The principal became concerned over continued high rates of disturbing, unproductive behavior in Mr. Randall's class. Things were especially out of control during periods set aside for study.

Jim Randall was not aware of many of the terms, ideas, and procedures already discussed. Fortunately, someone showed him how they might be useful in solving his problem.

Mr. Randall focused on one specific academic problem: nonattending of pupils during the academic task period. He arranged to have a student observer present in his room during the same period of certain days. Whenever a particular pupil was out of his seat, cleaning out his desk, tapping a pencil, or otherwise not attending to the task during that period, the observer entered an "N" (for nonattending) on a record sheet. An "A" indicated attending or task-appropriate behavior (writing an assignment, looking in the book). In this way Mr. Randall was able to obtain a baseline record. The observer also gave the teacher a baseline of his behavior. This gave Mr. Randall an idea of what *he* was doing and when he was doing it.

After establishing the baseline, Jim Randall introduced a special condition into the situation. He would show interest and give children verbal attention if he found them engaging in appropriate study behavior. During the baseline period, the average attending to task rate was 44 percent. The rate increased to 72 percent during the reinforcement period. This meant that Mr. Randall's *planned* use of a reinforcer (attention) was having a dramatic influence over study behavior. During a brief reversal period reinforcements were given for study behavior. There was a precipitous drop in on-task behavior. Resumption of reinforcement resulted in a return to a high rate of purposeful behavior during academic periods.

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[2] Adapted from R. Vance Hall, *et al.*, "Instructing Beginning Teachers in Reinforcement Procedures Which Improve Classroom Control." *Journal of Applied Behavior Analysis*, 1968, *1*, 315-322.

At one point before the initiation of the reinforcement program, the principal had called Mr. Randall's status precarious and considered replacing him. At that time Jim Randall was fully aware of his position and had been filled with self-doubt. However, in addition to developing skill in creating a productive learning environment, he developed more self-confidence. "You know, I think I'm going to make it." He did make it and was offered and accepted a contract to continue teaching.

Case 2. Using a Token Economy in the Classroom [3]

Reinforcers can be material (candy, cookies, pennies). They can also be symbolic and have exchange value (points, stars). For some children grades are highly meaningful symbols; for others, they mean little or may even have negative value. A token is a stimulus that acquires value because of its cash-in properties. Using effective tokens may help a teacher strengthen pupils' productive behavior.

Helen Kennedy had a special class of fourth-graders. These children posed problems in regular classrooms. They had more than their share of temper tantrums; they resisted authority and in many ways made life miserable for their teachers. Helen decided to try a token economy.

At the first meeting of her class she reviewed how the economy would work. The standard subjects of elementary education were broken down into a series of sequenced exercise sheets with instructions to the pupil about how to carry out assignments. Class began each day with each child being given an exercise sheet appropriate to his level. The child worked on the assigned problems, after which he was instructed to go directly to the teacher. He earned points (tokens) in proportion to the quality of his work. The points had reinforcing value according to a formal economic system. Ten points earned participation in recess activities; 20 points earned either a double length recess or, if the pupil preferred, the opportunity to feed three caged animals in the classroom.

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[3] Adapted from W. M. Vernon, "Nonmaterial Token Reward Systems With Severe Classroom Problems." Paper presented at the 1969 meeting of the Rocky Mountain Psychological Association.

Miss Kennedy enlisted the children's cooperation in arranging the rules under which the economy worked. As a result of their mutual planning, it was agreed another 20-point alternative would be serving as teacher's assistant, scoring the simpler exercises, and dispensing tokens for one-half hour. A child who had tokens valued at 25 points could have the high drama of being chauffeured home after school in the teacher's new convertible.

Helen Kennedy didn't arrive at the token economy overnight. She had to make a number of decisions. For example, she felt that a price tag should not be placed on everything. Consequently, her pupils did not need tokens in order to get a drink of water or sharpen a pencil. During the early weeks of her token program she had to make several adjustments in values to take account of the relative popularities of different activities.

What were the results of Helen Kennedy's program? By the second day the class was quiet except for occasional enthusiastic exclamations following token successes. Miss Kennedy's and the pupils' facial expressions became more cheerful. School, exercise problems, reading, and teacher became associated with fun. The token system helped circumvent the need for coercive controls. One child, officially described as "uncontrollable," had had numerous temper tantrums. Following his first tantrum in the token economy class he was told that he could have that one free but subsequent tantrums would cost him 10 points. Tantrums soon disappeared from his repertory.

There were a number of outcomes of Helen Kennedy's work. The children came to resent interference with their work activities. *All* of the children went completely through the fourth- and fifth-grade exercises during the first 7 1/2 months of the token economy. Half of them completed the sixth-grade assignments. Two children successfully completed the seventh-grade materials. Thus, Helen Kennedy's approach not only made school life more pleasant and satisfying for everyone, but also enabled each individual pupil to progress academically at as fast a rate as possible.

Case 3. A Way to Handle Tardiness [4].

Principles of behavior modification can be used with severe problems, such as those posed by Miss Kennedy's pupils, or with relatively minor but annoying, unproductive behavior.

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[4] Adapted from R.V. Hall, Connie Cristler, and Sharon S. Cranston, "Effects of Systematic Reinforcement Procedures on Tardiness, Using a Multiple-Baseline Tactic." *Journal of Applied Behavior Analysis*, 1970.

Fran Hardy had a class of 25 fifth-graders from upper-middle-class families. The boys and girls in the class were allowed to go to the restroom and to visit the drinking fountain following recesses. While most pupils returned promptly to class, there were a few stragglers who returned a minute or two after class had resumed. This caused confusion in the classroom, delayed the start of class, and annoyed Mrs. Hardy. After taking a course in which principles of classroom management were discussed, she hit upon this possible solution to her problem.

She observed who was late in returning to class following every recess. This provided a baseline that would permit her to gauge the effectiveness of her approach.

The tactic she employed was to close the classroom door 4 minutes after the first pupil entered the hallway outside the classroom on his way to the restroom following recess. Any pupil who entered the classroom after the door was closed was counted as being late. A pupil observed to be especially prompt was chosen to make a record of the number of late pupils. Mrs. Hardy chose as a daily reinforcing event a list of pupils who were on time. The list was posted on the bulletin board each day before the close of school. The names of all children inside the classroom before the door was closed were placed on the "On Timers" chart. Fran Hardy's success was clear-cut: tardiness virtually disappeared.

Mrs. Hardy made one noteworthy observation in the course of conducting her experiment. At first, she decided that the list of "On Timers" would include the names of only those pupils who returned promptly from the morning recess. No reinforcing contigencies were associated with the afternoon recess. She found that listing the morning's "On Timers" did not have a strong carry-over effect on the return of pupils from the afternoon recess. When an "On Timer" was defined as a boy or girl who returned promptly from every recess on a given day, the morning-afternoon disparity faded away. Fran Hardy learned that her pupils could become very attentive to the consequences of their behavior and that they could discriminate between presence and absence on reinforcers.

Case 4. Delinquency, Truancy, and Reinforcement [5]

A 14-year-old boy had a record replete with burglary, truancy, and running away. He was receiving failing grades in all his subjects and was considered

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5 Adapted from A. W. Staats and W. H. Butterfield, "Treatment of Nonreading in a Culturally Deprived Juvenile Delinquent: An Application of Reinforcement Principles." *Child Development*, 1965, *32*, 925-942.

incorrigible. When he entered a specially prepared reinforcement program, he was reading at about the second-grade level. The program involved tokens valued at fractions of a penny. The tokens could be cashed in for things the boy wanted. When he was working on increasing his vocabulary, he received a highly valued token for each errorless paragraph. If he had to repeat the paragraph before getting it correct, he received a token that was somewhat depreciated in value. Under this regimen the boy's attention span increased. He advanced to a fouth-grade reading level and passed all his courses. The cost of the entire training program (cash value of all the tokens he earned) over a 4 1/2-month period was $20.31. As the program proceeded, the boy had to make more and more correct responses to get reinforced. Gradually he was weaned from the tangible rewards and began to read because of the intrinsic pleasure he derived from it.

A Few Final Words

Toward Independence

Some teachers fear that success in behavior modification may lead to undue dependence of the pupil on extrinsic rewards and controls. Certainly the goal is to develop persons able to direct and control themselves. No one expects a 2-month-old baby to do this. Self-responsibility grows gradually. A key step is the transfer of behavior modification techniques from the teacher to the learner himself. An important teaching-learning unit could be an exercise in which children identify some behavior they would like to reinforce themselves and try out the various steps in recording and data-gathering--the baseline, then the reinforcement period, and reversal, perhaps, a return to reinforcement, possibly a longer-term contract. Development of skill in controlling their own behavior development is a big contribution to pupils' independence. It not only enables them to achieve more of their own goals; it also sensitizes them to manipulation by others. They can know when someone is trying to influence them, and can better resist if they wish to do so. Children make significant strides when they achieve self-direction and self-management. Consequently, it makes good sense to encourage them to perform like "behavioral scientists" and to carry out experiments themselves.

Becoming More Expert in Behavior Modification

For many readers this pamphlet will be only a beginning. Special inservice and professional training programs that probe more deeply into the topic of behavior modification and the individualization of instruction are becoming increasingly available. Your school or school district might wish to consider the possibility of conducting such a workshop. In some instances, certain school personnel (for example, a school psychologist) may have special expertise that can be communicated to others. Often, outside consultants are especially helpful in conducting workshops. Your local school district or State department of education probably can help you in identifying outside consultants and in planning a workshop or an inservice program.

Some Sample Problems

This pamphlet is not a scientific treatise, but some of the references in the bibliography are; and they can greatly enhance your skill in drawing out your pupils' best performance.

The authors have tried to demonstrate for you that carefully observing and recording what children do can help you plan more productive programs, that many reinforcers are available to a teacher, and that using them well calls for all the sensitivity and creativity you can bring to bear. Furthermore, behavior modification is applicable in managing both the social and academic aspects of the classroom.

Would you like to try your hand at behavior modification? If so, here are four sample problems. Devise your own solutions to them. Remember, there are no cut-and dried answers. Ask yourself these questions: What behavior will take the place of the undesirable response? What is a reinforcer for this child? Compare notes with your fellow teachers and see if there are common threads and procedural themes in your approaches even if your specific tactics differ.

1. James is 9 years old. He is a bully and frightens other children. Three of his classmates are reluctant to go to recess because he picks on them. How would you go about reducing his aggressive behavior? How would you strengthen his cooperative and socially desirable behavior.

2. Paul is 7 years old. He swears with abandon: "Who the hell cares?" "Damn learning to read." Not only are these comments disruptive, but they are "catching." A few of the other pupils are beginning to see if they can get away with swear words. As Paul's teacher, what would you do about his swearing?

3. Charlotte is a bright 6-year-old. Her relationship with the teacher appears to be excellent. She is verbal and cute. Adults are delighted that she is so precocious. Her relationships with the other children are not nearly so good. During recess she prefers talking to her teacher to playing with the boys and girls. What can her teacher do to increase her approaches toward and involvements with boys and girls?

4. Malcolm is 10. He reads at the second-grade level. His present rate of correct written responses in a programed instruction workbook is two per minute. At this rate he will probably not even finish the workbook this semester. What approach might you initiate? What observations have you made? Over what period? Have you specifically defined the behavior you are using as a target? What reinforcer would you try first? Why?

Glossary

Behavior. Any observable, therefore recordable, action. (A child speaks or stands or writes an answer. The teacher smiles or reprimands or ignores.)

Continuous reinforcement. A schedule under which reinforcement always follows a designated response.

Intermittent reinforcement. A schedule under which a reinforcement does not follow *each* correct response. Some but not *all* correct answers are followed by praise or some other positive reinforcement or "reward."

Positive reinforcer. A stimulus which increases the frequency with which a desired response is made. The reinforcing stimulus (praise, attention, reward) is contingent upon occurrence of the desired behavior.

Punishment. An aversive stimulus or consequence (being kept after school, exclusion from the playground) which decreases the strength of an undesired response.

Reinforcement. Any event or stimulus that follows a response and is valued by the recipient, thereby leading to an increase in the future strength of that response.

Response. A unit of behavior.

Schedule of reinforcement. A planned program of successive reinforcements. Reinforcements may be given whenever desired behavior is emitted or they may be administered intermittently.

Stimulus. Anything to which an individual responds (a pat on the back, a token, a projected goal). A stimulus may or may not influence behavior. If it does not exert an influence, it does not have reinforcing properties.

Token. An object (a gummed star, a point, or a poker chip) that acquires worth because of its trading value.

Selected Bibliography

Books and Pamphlets

Becker, W. C., Thomas, D. R., and Carnine, D. *Reducing Behavior Problems: An Operant Conditioning Guide for Teachers*. Urbana, Ill.: Educational Resources Information Center, National Laboratory on Early Childhood Education, 1969. 37 pp. $1.50 plus postage.

Emphasis is on preschool and elementary children. Brief but complete pamphlet provides a good introduction to the methods and results in operant conditioning (behavior modification) research.

Benson, Arthur M., *Modifying Deviant Social Behaviors in Various Classroom Settings*. Eugene, Ore.: Department of Special Education, College of Education, University of Oregon, 1969. 80 pp. $2.15 including postage.

Detailed procedures for behavior modification in different classroom settings with charts and data of experimental results, presented in two parts, "Teachers, Peers and Parents as Agents of Change in the Classroom" and "Special Class Placement as a Treatment Alternative for Deviant Behavior in Children."

Blackham, G., and Silberman, A. *Modification of Child Behavior: Principles and Procedures*. Belmont, Calif.: Wadsworth Publishing, 1970. $4.50 including postage.

Describes and analyzes more than 40 problems of major concern to teachers, counselors, and parents. Deals with children in grades K-6.

Fargo, G., Behrns, C., and Nolan, P. *Behavior Modification in the Classroom*. Belmont, Calif.: Wadsworth Publishing, 1970. $4.50 including postage.

Readings selected to demonstrate classroom-applicable principles of behavior modification. Deals with ethical considerations, applications to a broad range of academic and nonacademic problem behaviors, as well as the uses of behavior modification techniques by professionals other than teachers.

Homme, Lloyd, *et al.* *How To Use Contingency Contracting in the Classroom*. Champaign, Ill.: Research Press, 1969. Paperback, $3.62 including postage.

A how-to-do-it manual for teachers. Using a programed format, it shows in stepwise fashion how the contract can be a position force within the classroom.

Hunter, Madeline. *Reinforcement, Theory Into Practice*. El Segundo, Calif.: TIP Publications, 1967. 69 pp. Paperback, $1.75 plus postage.

A short programed book written for elementary teachers for daily use in their classrooms. Author also has written useful related small texts *Motivation* and *Learning More Faster*.

Meacham, M. L, and Gall, R. S. "Behavior Modification in the Schools: A Selected-Annotated Bibliography." Seattle, Wash.: School of Psychology and Counseling Laboratory, University of Washington, April 1970. (Mimeo.)

A comprehensive, up-to-date set of summaries of articles, books, and other materials on behavior modification. Divided into categories including behavior in schools, counseling, and a variety of social situations.

Meacham, M. L., and Wiesen, A. *Changing Classroom Behavior, A Manual for Precision Teaching*. Scranton, Pa.: International Textbook Company, 1969. 212 pp. $2.95.

A readable and practical guide to "precision teaching" with many examples of applications in the normal classroom as well as chapters on working with the retarded, the socially deprived, and the emotionally disturbed child. Emphasis on "humanistic behaviorism and ethics."

Patterson, G. R., and Gullion, M. E. *Living With Children: New Methods for Parents and Teachers*. Champaign, Ill.: Research Press, 1968. Paperback, $2.50 plus postage.

A spiral-bound programed book especially designed for parents to help them learn to deal with their children's behavior problems with simple techniques. Authors worked with many families while preparing the book, which includes sample behavior charts.

Skinner, B. F. *The Technology of Teaching*. New York: Appleton-Century-Crofts, 1968. Hardback, $5.50 plus postage; paperback, $2.95 plus postage.

A well-written, stimulating book by the discoverer of the scientific principle out of which behavior modification approaches have grown. Not concerned especially with classroom behavior, it is, rather, an attempt to rethink the whole educational enterprise in terms of reinforcement. Chapter titles include: "The Science of Learning and the Art of Teaching ," "Why Teachers Fail," and "Discipline, Ethical Behavior, and Self-Control."

Tharp, R. G., and Wetzek, R. J. *Behavior Modification in the Natural Environment.* New York: Academic Press, 1969. $10.

A thorough presentation of behavior modification principles as applied to behaviorally disordered children. Offers many practical suggestions and numerous examples.

Webster, S. W. *Discipline in the Classroom.* San Francisco: Chandler Publishing, 1968. 142 pp. Paperback, $2.70.

In an overall approach to classroom discipline, the author includes behavior modification as only one of many techniques useful to the classroom teacher. After discussing the nature of discipline, the classroom environment, and the teacher's role, the author presents 10 student behavior problems, five of them elementary and five of them secondary students, with evaluations of each situation by two or three experienced teachers, and invites the reader to draw his own conclusions.

Other Sources

Behavior Modification and Ideal Mental Health Services. Calgary, 44 Alberta, Canada: University of Calgary, Department of Psychology. 1969. Paperback, $3.00 including postage.

Conference proceedings. A state-of-the-art summary of reinforcement's use in schools, hospitals, the home, and other settings.

Educational Technology Monographs. Kalamazoo, Mich.: Kalamazoo Intermediate School District. A journal of special interest to those concerned with applying behavioral principles to school situations. Each monograph is sold and priced separately. An especially useful one is: *Operant Conditioning in the Public Schools* by R. Ulrich, M. Wolfe, and M. Bluhm, October 1968, 25 cents plus postage.

Journal of Applied Behavior Analysis. Lawrence, Kan.: University of Kansas, Department of Human Development. A journal reporting experimental research involving the applications of analysis of behavior to problems of social importance. Annual subscription rate: $4 for students, $8 for individuals, $16 for institutions.

Progress in Behavior Modification: Programs and Results. Honolulu, Hawaii: University of Hawaii, Social Welfare Development and Research Center. $2 plus postage.

Conference proceedings. A variety of applications of behavior modification by leading experts.

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Current ERIC Documents on Behavior Modification

Documents on behavior modification are entered in the ERIC bank under the term *behavior change*. Some of the more recent documents on this topic include:

Behavior Modification and Related Procedures. Exceptional Children Bibliography Series. ED 036 030. 8 pp. MF - 25¢; HC - 50¢.

A Token Reinforcement System in the Public Schools. ED 036 323. 16 pp. MF - 25¢; HC - 90¢.

The Results of a Pilot Program to Train Teachers in the Classroom Application of Behavior Modification Techniques. ED 031 754. 7 pp. MF - 25¢; HC - 45¢.

Behavioral Research Relevant to the Classroom. ED 039 036. 56 pp. MF - 25¢; HC - $2.90.

Modification of Disputing and Talking Out Behaviors With the Teacher as Observer and Experimenter. ED 039 298. 24 pp. MF - 25¢; HC - $1.30.

New Ideas in Michigan Education: Behavior Modification. ED 033 184. 30 pp. MF - 25¢; HC - $1.60.

The Effect of Points Exchangeable for Grades as a Reinforcer for Study Behavior of High School Students. ED 038 674. 13 pp. MF - 25¢; HC - 75¢.

Copies of the above documents are available, in microfiche (MF) and hardcopy (HC) at the prices cited, from the ERIC Document Reproduction Service, National Cash Register Company, 4936 Fairmont Avenue, Bethesda, Maryland 20014.

EVALUATION ► PRACTICE

Effective dissemination, especially of research and development findings, can be a powerful force in advancing the cause of education. To facilitate communication between the researcher in the laboratory and the educator in the classroom, the Bureau of Research has inaugurated a special report service. These reports, prepared under USOE contracts, are interpretations of educational research and development directed at solutions to problems faced by the Nation's schools. Many State agencies and other groups concerned with education are participating in this service by repackaging and disseminating the reports to meet the needs of their local school districts. The cooperating agencies have been selected because of their strategic position in the educational community. Through this joint effort the Bureau of Research hopes to strengthen State and local educational information services and to speed the adoption of tested educational innovations.

Norman J. Boyan / Associate Commissioner for Research

putting research into educational practice